Patent Claims:

1. Device possessing the following components:
   a) a UV source (1) for excitation light in the wavelength range from 140 to 320 nm;
   b) a separation medium (2) for a flat-bed electrophoretic separation of electrically charged substances, or a separation medium (2) for a flat-bed chromatographic separation of electrically charged or neutral substances;
   c) regions, which are distributed in the separation medium (2), of substances which are to be separated and which have been separated and which are also unlabelled, which substances emit, on excitation with the said UV source (1), UV fluorescence in the wavelength range from 150 to 400 nm;
   d) a UV detector (3) for the UV fluorescence radiation; and
   e) optical or optoelectronic components for filtering, guiding and/or amplifying the excitation radiation and the fluorescence radiation.

2. Device according to Claim 1, characterized in that the UV source is a laser; UV lamps or lasers for multiphoton excitation.

3. Device according to Claim 1, characterized in that the UV source exhibits an energy density of from 0.1 to 3500 mJ per cm^2, as measured at the surface of the separation medium.

4. Device according to Claim 1, characterized in that the wavelength of the excitation light is from 140 to 320 nm.

5. Device according to Claim 1, characterized in that the separation medium is metal oxides, salts, papers, celluloses or crosslinked, gel-forming polymers.

6. Device according to Claim 5, characterized in that the gel-forming polymers are polyacrylamides, agarose or dextran.

7. Device according to Claim 1, characterized in that the separation medium (2) is a separation medium which is used in flat-bed chromatography (thin layer chromatography).

8. Device according to Claim 1, characterized in that the separation medium is applied to a support and, where appropriate, provided with a UV-permeable cover.

9. Device according to Claim 1, characterized in that the component c) substances contain aromatic or heteroaromatic residues and/or optionally conjugated unsaturated carbon double bonds and/or carbon-heteroatom double bonds and/or nitrogen multiple bonds and electrically charged groups.

10. Device according to Claim 9, characterized in that the substances are proteins.

11. Device according to Claim 1, characterized in that the UV fluorescence is from 150 to 400 nm.

12. Device according to Claim 1, characterized in that the UV detector is a CCD camera, a photomultiplier, a semiconductor diode or a semiconductor diode arrangement.

13. Method for determining substances which are separated by means of 1D or 2D flat-bed electrophoresis, in which method unseparated and separated substances are irradiated, in the separation medium for electrophoretic separations, with a light source and emitted fluorescence light is measured using a detector, characterized in that (a) by means of the action of UV light in the UV range, fluorescence-emitting substances (b) in the separation medium are irradiated directly with UV light of a wavelength of from 150 to 320 nm and (c) the UV fluorescence is measured at wavelengths of from 150 to 400 nm using a UV-sensitive detector.

14. Method according to Claim 13, characterized in that the separated substances are transferred from the separation medium to a laid-on membrane by applying an electrical field perpendicular to the plane of the separation medium.

15. Method according to Claim 14, characterized in that the membrane is composed of nitrocellulose or polyvinylidene fluoride which are employed in Western blotting methods.

16. Method according to Claim 14, characterized in that the transferred substance regions are treated with unlabelled antibodies and their inherent fluorescence in the

UV range is then measured after exciting with UV radiation.

17. Use of the device according to Claims 1 to 12, or use of the method according to Claims 13 to 16, for separating and determining disease-specific substances in samples taken from the human or animal body or from plants.